PHYSIOTHERAPY IN OBSTRUCTIVE AIRWAYS DISEASE

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The physiotherapy techniques used in the treatment of asthma, chronic bronchitis and emphysema are very similar, but their application in the treatment of these diseases is totally different. For this reason the diseases will be dealt with separately.

Asthma

Physiotherapy may be ordered for asthma patients whose condition will vary from the person in status asthmaticus to someone completely free of asthma at the time of treatment.

The type of patient seen by physiotherapists in outpatient departments will vary from a young child to the older individual with more chronic disease. It should not be necessary for outpatients to attend for long periods of treatment, since the rôle of the physiotherapist is to educate the patient and his relatives in how to cope with his condition at home. It may be necessary to treat the patient subsequently for limited periods of time during acute exacerbations, but if the patient has been correctly trained by the physiotherapist, he should be able to cope on his own for most of the time.

The aims of treatment are to achieve bronchodilatation, to remove any secretions present and to teach the patient how to control his breathing in various relaxed positions. Children may require posture exercises.

It is helpful to assess patients before and after physiotherapy by means of a peak flow meter or a Vitalography. Many outpatients will get a measurable response to a bronchodilator given by means of a pressurised aerosol, providing they are using the device correctly. Patients who do not get a good response are frequently using the device incorrectly and it is impor-

tant for the physiotherapist to check on this and, if necessary, to use a placebo aerosol to educate the patient in the correct technique. There are a few patients who seem to get a better response from wet nebulisation and in these cases the prescribed bronchodilator can be delivered by means of a simple nebuliser run off oxygen or an air compressor. (The Hudson or Minineb nebulisers are suitable for this.) It is not necessary to deliver bronchodilators by means of IPPB for this group of patients (Webber et al. 1974).

Maximum bronchodilation will have been achieved about ten minutes after the inhalation of the drug and patients with secretions should be encouraged to cough at this stage. Many chronic asthmatics have secretions and benefit from postural drainage or a modified form of this combined with basal expansion and chest shaking. It should be remembered that excessive coughing can increase airways obstruction and that asthma patients should not be forced to cough unnecessarily.

It is important to teach patients how to breathe when in respiratory distress; they should be instructed to get into a relaxed position (high side lying, forward lean sitting or kneeling, relaxed sitting or standing), and to do gentle diaphragmatic breathing at their own rate. Once they have achieved a more controlled and coordinated pattern of breathing, they may then be able to slow down their respiratory rate. Breathing exercises alone will not alter the results of pulmonary function tests in asthmatic patients; the aim is to teach the patient to breathe with the minimum of effort.

Patients with severe asthma which is not responding to treatment may have to be admitted to hospital. Assessment is extremely important and, if possible, a peak flow chart should be kept in order to monitor the patient's progress. The prescribed bronchodilator should be delivered by means of a simple nebuliser. Occasionally IPPB can be used, although it should only be considered if the patient is very exhausted or is known to have particularly large and tenacious plugs of sputum as in aspergillosis. The inhalation is given in a sitting or high side lying position.

Certain patients start to cough spontaneously during the inhalation and once it is completed assistance can be given by gentle shaking to alternate sides of the chest in a sitting or high side lying position. If the cough is not productive, the physiotherapist should not persist in attempts to mobilise secretions, as this will only aggravate bronchospasm. In this situation, the patient should be made comfortable and encouraged to breathe with the minimum of effort and the treatment repeated four hours later. Until bronchodilatation has been achieved, it is impossible to mobilise the secretions and several treatments are sometimes necessary before the patient is able to expectorate.

Once the patient's condition starts to improve, those wth excessive secretions will benefit from postural drainage after use of the bronchodilator. If the patient is dyspnoeic he may not tolerate this and it is better to treat him in alternate side lying or high side lying.

When the results of pulmonary function tests have improved and stabilised, the nebuliser should be discontinued and the bronchodilator given by means of a pressurised aerosol. Before discharge from hospital, the physiotherapist should ensure that the patient and his relatives know how to manage at home.

It is very rare to have to intubate and ventilate an asthma patient, but if the PCO_2 is raised and pulsus paradoxus is present, it may be necessary to ventilate such a patient as a life-saving measure. Physiotherapy has no rôle to play in the treatment of a patient immediately after intubation as manual hyperinflation ("bag-squeezing") and shaking of the chest will only aggravate the bronchospasm (Gormezano and Branthwaite 1972). Once bronchodilatation has been achieved, gentle physiotherapy can be commenced in order to mobilise secretions. A bronchodilator should be given before physiotherapy and it is helpful to instil normal saline into the endotracheal tube during treatment. Initially the patient should be turned onto alternate sides and gentle chest shaking performed on expiration in time with the ventilator. If this does not have a detrimental effect, which will be shown by increased inspiratory pressure on the ventilator, manual hyperinflation can be attempted. If any signs of increased bronchospasm become apparent, the treatment must be modified. Once the patient has been extubated, treatment will be continued as before.

Chronic Bronchitis

The main problem in chronic bronchitis is hypersecretion of mucus and the primary aim of physiotherapy is to assist the patient in clearance of his secretions. As the disease progresses, the patient may develop secondary emphysema and will require help with control of breathing. Physiotherapy should be adjusted to cope with the dominant factor.

In the early stages of the disease, these patients will be seen in outpatient departments and the main aim of physiotherapy is to teach the patient how to clear his secretions and to try to increase his exercise tolerance. If the patient is dyspnoeic, positions of relaxation with breathing control can be helpful and the patient should be taught how to control his breathing when walking uphill or on stairs. As in asthma, these patients should attend for treatment in order to learn how to cope on their own at home and should only attend subsequently during acute exacerbations of their disease. If the physiotherapist is able to devote time to educating these patients and their relatives in how to manage at home, rather than treating numerous chronic outpatients for unlimited periods of time, much will have been achieved.

It may be helpful to get an outpatient to use a bronchodilator before giving postural drainage. It is important to teach the patient how to clear his secretions each day at home and to show him how to tip himself twice daily. If the bed cannot be tilted, a simple method is to tie a pile of newspapers together and place pillows over this; the patient can lie over this in order to tilt the thorax. If relatives are willing to help, they should be shown how to percuss and shake the chest wall.

It is important for patients with chronic bronchitis to take exercise, and a simple means of doing this is to give the patient a certain distance to walk or a number of stairs to climb each day and to gradually increase the time and distance: e.g. to walk up and down five steps for two minutes and gradually increase the time and then the distance (McGavin et al, 1977).

Patients who are dyspnoeic should be taught breathing control as for asthma and it is important to teach controlled rhythmical breathing on stairs and hills (e.g. out for two steps and in for one step).

The main aim of outpatient physiotherapy is to educate the patient and his relatives in home management. Long-term treatment is not necessary, although the patient should be able to return for further treatment if a fresh infection occurs.

Patients admitted to hospital with acute exacerbations of chronic bronchitis will require vigorous physiotherapy to assist in removal of secretions. Although many of them may be suffering from cor pulmonale, once a suitable medical regime has been established, this should not be a deterrent to giving postural drainage and most patients will tolerate this. It is often

helpful to give a bronchodilator prior to physiotherapy and certain patients will benefit from additional humidity. If the patient has difficulty in mobilising his secretions and becomes exhausted during physiotherapy, it may be helpful to use I.P.P.B. during postural drainage for a limited period. Most patients will be able to manage with a mouthpiece but if they are confused or unco-operative, the use of a mask may be necessary. If a mask is used and the patient is semi-comatose, it is important to ensure that the chest wall is moving adequately, otherwise CO_2 can build up in the mask. It is important to adjust the pressure and flow rate of the machine correctly in order to achieve chest wall movement. The patient can be given postural drainage while I.P.P.B. is being used and the chest wall shaken on the expiratory phase. This is often very effective in the mobilisation of secretions. Treatments should last about twenty minutes and be repeated two-hourly initially. If the patient does not cough spontaneously, it may be necessary to carry out nasopharyngeal suction during treatment. Vigorous and effective physiotherapy can often prevent the need for intubation of these patients.

On the rare occasions that such patients are intubated and ventilated, physiotherapy, consisting of manual hyperinflation combined with chest shaking and postural drainage, should be commenced as soon as the patient has stabilised on the ventilator. The aim is to clear the secretions as quickly as possible in order to avoid tracheostomy and long-term ventilation.

Emphysema

The main aim of physiotherapy for emphysema is to teach the patient a more co-ordinated and controlled pattern of breathing, to teach positions of relaxation that he can use when dyspnoeic, to try to increase exercise tolerance, although this will probably be limited, and to deal with infections when they occur.

Controlled diaphragmatic breathing with relaxed expiration should be taught in high side lying and forward lean sitting; this can progress to the use of the upright position, and eventually the patient should be able to breathe in this manner when standing or walking about, although this may take time. Some emphysematous patients get a certain amount of response from a bronchodilator and, if so, this should be given before physiotherapy.

A programme of graduated walking should be worked out for each individual as for chronic bronchitis, but an emphysematous patient will be limited in the amount he can do. Very severely disabled patients are sometimes helped by a high walking frame and an oxygen cylinder can be attached to it if necessary.

Many emphysematous patients have problems with bathing and dressing, and advice from an occupational therapist on these aspects can be invaluable.

The majority of emphysematous patients do not have a large amount of secretions and these can usually be cleared by shaking the chest wall in high side lying or lying flat on alternate sides if the patient will tolerate it. Because of their flattened diaphragms, the majority of emphysematous patients are unable to tolerate tipping. There is a tendency for them to get airway shutdown whilst coughing which can sometimes result in cough syncope; the patient should be instructed to take another breath in after every two or three coughs.

If a patient has difficulty in mobilising his secretions, I.P.P.B. combined with chest shaking may be helpful, but the inspiratory pressures should be kept lower than normal and it is contra-indicated if any large bullae are present.

In conclusion, the rôle of physiotherapy in the treatment of obstructive airways disease is to educate the patient and his family in how to manage at home and to treat any subsequent acute exacerbations that occur either in hospital or as a short-term outpatient.

References

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